

### **Abstract of the Disclosure**

An optical-based sensor for detecting the presence or amount of an analyte using both indicator and reference channels. The sensor has a sensor body with a source of radiation embedded therein. Radiation emitted by the source interacts with indicator membrane indicator molecules proximate the surface of the body. At least one optical characteristic of these indicator molecules varies with analyte concentration. For example, the level of fluorescence of fluorescent indicator molecules or the amount of light absorbed by light-absorbing indicator molecules can vary as a function of analyte concentration. In addition, radiation emitted by the source also interacts with reference membrane indicator molecules proximate the surface of the body. Radiation (e.g., light) emitted or reflected by these indicator molecules enters and is internally reflected in the sensor body. Photosensitive elements within the sensor body generate both indicator channel and reference channel signals to provide an accurate indication of the concentration of the analyte. Preferred embodiments are totally self-contained and are sized and shaped for use in vivo in a human being. Such embodiments preferably include a power source, e.g. an inductor, which powers the source of radiation using external means, as well as a transmitter, e.g. an inductor, to transmit to external pickup means the signal representing the level of analyte.